

# ORGANIZATIONAL TRUST IN NAVAL SHIP DESIGN BUREAUS *FRANCE, GREAT BRITAIN, AND THE UNITED STATES*

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How mechanisms and issues of “organizational trust” develop and are perpetuated in the professional corps of naval ship design bureaus of France, Great Britain, and the United States provides insight for management theorists studying this developing area. This article focuses on the current and historical roles of these professional corps, and shows how the differences in societal trust in government affect the bases of trust within the organizations. Finally, it argues for the need to maintain naval ship design bureaus that have a strong professional corps, which will strengthen organizational trust and ensure better internal and external relations.

**T**he byword of management theorists is fast becoming “trust”, rapidly overtaking “quality” as the measure of merit in an organization. An organization operates more smoothly when there is a high degree of trust internally and with its customers. In organizations, “trust” is based on competence and responsibility, and it is in this context that I’ll discuss how trust operates within the naval ship design organizations of these three nations, with a particular emphasis on the role of the professional corps.

## **A BRIEF HISTORY OF NAVAL DESIGN BUREAUS**

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Naval constructors (the generic term used here to describe warship designers) are descended from shipwrights, who oversaw the construction of ships the way a master craftsman would oversee the building of furniture. The art of shipbuilding was handed down from master to apprentice, or father to son; it was not until the middle of the 18th century that the slow road toward the professionalization of ship constructors began.

## FRANCE

Pride of place goes to France for forming the first professional corps of naval constructors. The *Génie Maritime*, as it was known (*génie* means both engineer and genius), was formed in 1765, and was marked by a rigid system of application into the corps, including the training in shipyards and education in engineering, and a formal system of advancement based on technical merit. The *Génie Maritime* became the model for the naval construction corps of many countries, including Spain, the Netherlands, Japan, and Britain (SPEI, 1965, pp. 11–15). The constructors of the *Génie Maritime* operated autonomously, each in their own shipyards, until 1895, when ship design was centralized into one bureau. In the 1930s it subsumed the Naval Artillery Corps, and in 1961 it became what would be called the *Direction des Construction Navales* (DCN) and was incorporated into the centralized military procurement agency now called DGA, *Délégation Générale pour l'Armement* (SPEI, 1965, pp. 63–88).

## GREAT BRITAIN

The Royal Navy was actually slower to adopt the model of the *Génie Maritime* than other navies, in part because it was producing highly successful ships without it. The first efforts began in 1805 under the Barham Commission, which sought to rectify the perceived inferiority

of British warships by, among other things, establishing a formal educational system for its constructors. This effort was short-lived, and it was only in 1864 that a permanent school at Greenwich was created (Brown, 1983, pp. 25–27). Although British constructors often led the world in technological innovations, it was not until the Captain affair of 1871 (when a privately designed battleship sank with almost all hands, and an inquiry board found that the Admiralty constructors were correct in rejecting it) that their struggle for professional recognition was fulfilled. In 1883, a professional body modeled on the *Génie Maritime* was formed, known as the Royal Corps of Naval Constructors (RCNC), whose chief was the Director of Naval Construction. His power gradually waned after WWII, as both the Navy and the British empire shrank (Brown, 1983, pp. 60–95). By 1993, the Ministry of Defence began consolidating the service acquisition agencies into a centralized joint Procurement Executive (PE).

## UNITED STATES

The United States did not have anything comparable to the great fleets of Britain and France until the late 19th century, and in its early years the Navy's ships were designed by a curious hodgepodge of both government and private naval architects. Under the Bureau of Construction and Repair (BC&R), a Construction Corps of

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naval officers was established in 1866. However, formal instruction in ship design was not instituted until 1879, when graduates from the Naval Academy at Annapolis were selected to attend the RCNC school at Greenwich. For two decades, U.S. constructors were educated abroad, until 1901 when a course modeled on the Greenwich school was established at the Massachusetts Institute of Technology in Boston. It was only then that the U.S. Navy had a professional corps of officers that resembled the French and British, in terms of a professional cadre who received a uniform system of training and were held to a uniform standard (USN BC&R, 1937, pp. 34–42). Just before WWII, the BC&R was combined with the Bureau of Engineering to form the Bureau of Ships (BuShips); at the same time, the Construction Corps was disbanded, thus moving ship design into the hands of civilian naval architects. BuShips eventually became the Naval Sea Systems Command (NAVSEA).

## **NAVAL SHIP DESIGN ORGANIZATIONS TODAY**

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The post-Cold War downsizing has considerably changed each country's naval design organization, and in very different ways. While the French and British navies are roughly comparable in scale, the United States has a budget seven times larger, with over 3 times as many ships and 10 times the personnel (Ferreiro, 1997, p. 57). The sheer difference in size of the U.S. Navy helps to explain some differences with the other two.

In both the French and the British Ministry of Defence (MoD), the naval ship

design organizations fall under a joint civilian procurement agency, which is separate from the military operational organization. In France, Direction des Construction Navales is the warship acquisition arm of the Délégation Générale pour l'Armement (DGA), and does all ship design in-house. In Great Britain, the PE is divided into a dozen "business units" organized by function and not service; the naval units now oversee warship

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acquisition, but the actual design work is done by industry. Both DGA and the PE are headed by civilians who report to their respective Defence Ministers, and they contain both the program management and technical support for warship acquisition.

By contrast, the United States Department of Defense (DoD) has a separate procurement agency for each service, in part because of the sheer size of each service—the U.S. Navy budget alone is more than the total military budget for either France or Britain. The Navy organization is a mix of military and civilian structures. The technical support agency for Navy procurement, NAVSEA, falls under the operational side (Chief of Naval Operations [CNO]) and has a military head. However, the responsibility for procurement itself falls under the civilian Assistant Secretary of the Navy for Research, Development & Acquisition, whose Program Executive Offices control acquisition through an operational agreement with NAVSEA (which

increasingly shares design responsibility with industry).

## THE NAVAL CONSTRUCTORS

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civil service, which allows for rotational assignments throughout one's career to afford a broader view of the organization. The United States, by contrast, hires its constructors into the civil ser-

vice system with fairly broad educational requirements, and the career path does not allow for rotation except by transfer.

In France and Britain, the naval constructor's education is integral to the professional corps, and indeed is the first step in its development (similar to the role of, say, the Naval Academy within the officer's corps). Almost all French and British naval constructors learn naval architecture at specific schools (in France, ENSTA in Paris or ENSIETA in Brest; in Britain, at the University College London). It is there that the students begin developing the professional and personal relationships that will carry on through their careers, first by getting to know their future colleagues as students, and second by getting to know their professors, who are

part of the naval design corps and thus their future bosses. (By the same token, the professors get to know their future employees.) In addition, the students receive training geared to their future employment, as opposed to the more general education given to American students. NAVSEA has no independent professional corps of naval constructors (it is not permitted under the current civil service) with an integral educational path—they do not even need a degree in naval architecture. Thus, the engineers don't begin to form a "community" until after they start their careers, and they never develop the same level of *esprit de corps* as do their counterparts in Britain and France.

Career paths differ among the countries as well. French constructors are military, though operate more as civilians and only wear uniforms in certain postings. Although British constructors are civilian, they have a military rank and must wear uniforms in certain postings. American constructors are civilian. In Britain and France, posts are rotated every few years, and promotions are handled rather like in the military—the new posting depends on the rank. In the United States, there is no rotation, and promotions come only with new jobs. Some points worth noting:

- The career focus is quite different in each country. French constructors become well-rounded but hands-on engineers. British constructors focus on acquiring a wide range of engineering management capabilities. American constructors concentrate on developing their specific area of expertise.
- The rotational assignments in France and Britain can be quite varied, often

including stints in the research and development (R&D) and program management fields, and possibly one or more postings overseas to gain diplomatic experience. The American constructor usually stays in one bureau, slowly moving up the ranks, and tends to be more thoroughly immersed in his or her field. Thus, British and French constructors have a broader but shallower knowledge of the overall process and organization, while the American's knowledge tends to be more limited but deeper in the area of his or her expertise.

## CONCEPTS OF TRUST

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"Trust" is a relatively new term in the study of organizational behavior, but the precepts have existed for a long time. They have often been grouped under the rubric of professionalism and ethics, although this has generally been limited to the interaction between an organization and the public. Naval ship design organizations are somewhat different in this regard, as their ultimate customers are not the public but the fleet.

The most useful definition for the word "trust" is "a process of expectation"; you believe or trust that another person or organization will do something particular or act a certain way, and base your actions accordingly. The two fundamental parts to this trust are the expectation of technical competence (that the other party will perform a task in a capable way), and the expectation of fiduciary responsibility (that the other party will perform that task with the customer's [or public's] interests placed before their own interests) (Barber, 1983, p. 9).

Another useful definition is that of a professional organization: knowledge, and specifically, the capacity to make decisions based on that knowledge; considerable autonomy (i.e., a high degree of self-regulation); and a high level of fiduciary responsibility (Barber, 1983, p. 136). The degree to which each naval design organization meets these criteria is also a factor in determining how the mechanisms of trust operate.

Finally, the framework for comparing the mechanisms of organizational trust consists of three levels: societal (i.e., between society and government as a whole), which establishes the overall environment of trust; external (i.e., how the government operates with the naval ship design bureaus), which establishes the mechanisms of trust between customer and supplier; and internal (i.e., within the naval ship design bureaus themselves), which considers those mechanisms in both management-worker and co-worker relationships.

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## SOCIETAL TRUST

The 1997 legislative elections showed that the French people remain attached to a strong, centralized, interventionist government. About 55 percent of France's gross domestic product (GDP) is government-generated, and many of the largest firms are either state-owned enterprises or ones in which the government is a majority shareholder. Of the three countries, France is arguably the only one in which

government workers are held in high regard (the word *fonctionnaire* conveys a measure of utility not associated with the word “bureaucrat”). Civil servants come up through a set formation, and unlike in the United States, where the “best and brightest” form software companies, in France they become public servants. In addition, France

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has long perceived that its government offers a higher level of fiduciary responsibility than the market does; even Alexis de Tocqueville

pointed out the tendency of the French people to request state aid in time of need, rather than to form local groups, and of manufacturers to ask the state for protection from competition instead of improving their works (Fukuyama, 1995, p. 235). In short, the French people place a high level of trust in their government, because the state offers both technical competence and at least the perception of fiduciary responsibility.

Post-World War II Britain was as socialist as any country on the continent, and large chunks of industry were nationalized in 1950s and 1960s. There was a clear faith in the fiduciary ability of government to ensure social equity, and the Civil Service was an Oxbridge-trained, nonpartisan body that ran things, if not efficiently, then at least adequately. However, by the mid-1970s the resulting “English disease” of inflation, high unemployment, and endless strikes soured the public on the socialist model. In 1979, Margaret Thatcher

set in motion a chain of events which echoed the groundswell of public opinion; de-industrializing the government and reducing its control over business and private concerns (The Economist, 1996, pp. 6–11). By the mid-1990s the societal trust in British government was much lower. The Labour landslide in Great Britain’s 1997 parliamentary elections did not demonstrate a return to a socialist form of government. The government continues to privatize most state-owned enterprises and now runs government agencies like businesses (e.g., they are often headed by a chief executive officer (CEO) on contract, instead of by a political appointee (Osborne, 1996, p. 8). Not coincidentally, this trend toward a smaller, leaner, more efficient form of government has come at a time of lowered public confidence in its workings.

The United States has a long history of mistrust of government and strong belief in the individual. Alexis de Tocqueville, who lamented his countrymen’s reliance on the state, noted with apparent awe the Americans’ faith in self-reliance. Although in the 1950s and early 1960s faith in government was high, mistrust was re-ignited after the debacles of Vietnam and Watergate, and the failed attempt at the Great Society. Ronald Reagan put his mark on this view by declaring the government to be the problem and not the solution. As with Britain, the relative success of the Democrats in the 1992 and 1996 presidential elections did not signal a return to the ideals of a welfare state. The current efforts to “reinvent government” by dramatically cutting numbers of employees clearly illustrates the low level of trust that society currently holds for the government (Economist 1996, pp. 29–31).

The perception that bureaucrats create more problems than they solve shows their apparent lack of technical competence, and the belief is strong that they are more interested in maintaining their jobs than making improvements, thus violating their fiduciary responsibility. Of the three nations' peoples, citizens of the United States trust their government the least.

### **EXTERNAL TRUST**

The preceding sections have described how the French government operates in a high-trust environment, the British government in an evolving but decidedly lower trust environment, and the United States government in a very low trust environment. The environment affects the mechanisms by which trust is produced. Lynne Zucker, a professor of sociology at the University of California at Los Angeles, identifies three basic mechanisms of trust production. The first is process-based, that is, the gradual accumulation of trust by experience. This mechanism is emphasized in teaming. Second is characteristic-based: the presumption of trust because of a shared background or culture—for example, the “old boy’s network” of graduates from XYZ University. The third is institution-based, i.e., the presumption of trust based on a formal title or organization—such as a patient’s trust of a doctor, or trust in a professional corps (Creed and Miles, 1996, p. 19). These three mechanisms can be classified as collegial mechanisms. To this, one may add two adversarial mechanisms: evidentiary trust (based on an overwhelming accumulation of proof that the other party is providing competently derived, unbiased information); and third-party trust, which, as the name implies, requires an outside

body to verify the information (and this, of course, entails its own trust mechanisms). These last two are the very antitheses of trust, in that they presume an unwillingness by one party (the client) to accept the information provided by another (the supplier) at face value, or with a minimum of confirmation. The mechanisms of external trust can be examined at two levels: first, between the legislature and the executive (specifically, defense); and second, between the executive and the ship design bureau.

#### ***Legislative–executive interaction.***

Both France and Britain have a parliamentary system, which means that the Defence Minister is chosen from the party in the majority. In the United States, the Secretary of Defense is chosen by the President and may not be from the majority party in Congress. One result of this difference is that Congress exercises substantial control over the DoD, often reworking the appropriations and procedures,

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as well as continuously auditing DoD policies. British and French parliaments exercise limited control over Ministry of Defence budgets; they may approve or reject the whole budget package, but do not usually tinker with the details (Ferreiro, 1997, p. 57). One fallout of this is the greater vulnerability of U.S. administration officials to Congress, and the commensurate need for greater technical support (Brickman et al., 1985, p. 93).

In the case of the French and British systems, trust between legislature and Ministry of Defence tends to be characteristic-based, as the Minister not only comes from the same party; he is often a strong figure within the party. The United States operates on a more adversarial basis, and the appointment to Secretary of Defense often entails a grilling before the Senate. The trust mechanisms most frequently used in the United States are evi-

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dentary and, to an increasingly greater degree, third-party. An example of the latter can be shown in the formulation of national security strategy.

The U.S. DoD relies heavily on the use of a large number of think-tanks such as RAND and the Brookings Institution to formulate policy. Think-tanks tend to have the ear of congressmen and top officials, far more than do DoD analysts who must operate through their chain of command. By contrast, the formulation of policy in France is very much internal to the MoD, and the few think-tanks that exist have very little input into policy formation (Ranquet, 1997, pp. 5–15). Britain's use of "brain trusts" in formulating policy has historically been very limited, but is on the rise.

**Executive–ship design bureau interaction.** In both France and Britain, the ship design bureaus within DCN and PE are not part of the Navy, but fall under an independent acquisition organization within each one's MoD. The Navy bureaus do not control the design organizations, but

rather are "customers" in that they set requirements and request products from the design bureaus. In the United States, the ship design bureau NAVSEA is part of the Navy, so in fact the ship designers are therefore not independent of their customers, but rather their agents; there are also several more layers in the U.S. bureaucratic system than in either the French or British systems (Ferreiro, 1997, p. 59).

This, then, calls into question whether NAVSEA's ship design bureau can be defined as a professional body. As stated earlier, it has no recognized "constructor's corps" as did BC&R earlier in the century, or as do the French and British systems. Harkening back to the definition of a professional body (knowledge, autonomy, fiduciary responsibility), it appears to fail on the autonomy test; that is, a profession cannot operate as an agent of the customer and solely for the customer's benefit, but rather must be held independently responsible for its services (Barber, 1983, p. 113). Since NAVSEA falls under the authority of the CNO (the customer for ship designs), it is not a fully independent body in that it falls within the customer's chain of command, and is therefore an agent of the customer. By contrast, the French and British organizations have a higher degree of autonomy by virtue of the fact that they fall outside the chain of command of the operational Navy, and therefore operate as independent suppliers of design services. This difference in autonomy, combined with other factors described above, leads to quite different mechanisms of trust between the executive and design bureaus in each country.

The French organization DCN operates in the highest societal trust environment,



its control by the legislature is comparatively weak, it has a high degree of autonomy, and it is staffed by a professional corps. All the factors are present for a high-trust relationship with the executive, and it appears that trust is produced by all three collegial mechanisms. First, even though personnel rotate, the executive structure tends to remain in place for five to seven years, creating a confidence not found in shorter tenures (process-based mechanism). Second, the executive staff within DGA and DCN are often constructors themselves (characteristics-based mechanism). Third, the statute of DCN as an independent professional body, staffed by a professional corps, makes a strong statement of competence and fiduciary responsibility (institution-based mechanism).

In Britain, the trust relationship between the Royal Corps of Naval Instructors and the executive is far less strong now than before, but the decline is fairly recent. All three collegial trust mechanisms operate to some degree, but less so than in France; specifically, ship designs are no longer produced by the government, but by industry, so the constructor's role is diminished in engineering terms to overseeing the technical product. The most prevalent mechanism, institution-based trust, was possible when the RCNC had considerable autonomy and control over the ship design process, but is no longer a major component since their autonomy and control has dwindled.

In the United States, the trust relationship between NAVSEA and the executive is based on paperwork, reviews, and third-party oversight. Evidentiary trust is the primary mechanism, and the ship design process (DoD Instruction 5000.1)

contains several dozen separate steps, each requiring extensive technical support for decisions and high-level reviews at the Navy and DoD levels; the process can take 10 years. Third-party trust is evident in the Instruction 5000.1 requirement for an independent analysis of cost and operational effectiveness. This is generally performed by a think-tank, such as the Center for Naval Analysis. During the design, the CNO is also guided by independent review councils

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such as the Naval Studies Board. It should be noted, however, that this use of external consultants is typical in U.S. governmental agencies, and much rarer for British and French ones (Brickman et. al, 1985, pp. 157–168). By contrast, the trust relationships between the old BC&R and the executive appear to have been highly institution-based, similar to the RCNC (although the historical details are sketchy); certainly, the Construction Corps was more autonomous (i.e., they had considerable authority over the ship design process without excessive external control), carried more political clout, and appears to have commanded more external respect than does the current NAVSEA organization.

## **INTERNAL TRUST**

To a great extent, the mechanisms of internal trust are driven by what is required external to the organization. In this respect, it follows from the preceding arguments that the French DCN has the highest degree of internal trust, NAVSEA the

lowest, and the British PE somewhere in the middle. In higher trust organizations, where the self-identity and solidarity is strong, decisions are taken in a less formal process; for example, design criteria may not always be specified on paper, but agreed to on a case-by-case basis. Lower trust organizations like NAVSEA will tend to codify criteria upon which to base decisions (Misztal, 1996, p. 67). The role of

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the professional corps, as found in France and Britain, is to institutionalize the process of gaining experience, both by

ensuring uniform educational backgrounds and by a consistent career path and formation. Thus there is a higher level of trust between co-workers and between supervisors and employees, since each has been through the same system. This accounts for the fact that British and French constructors are usually given a higher level of responsibility early on, compared with their U.S. counterparts. Also for this reason, British and French constructors are generally more free to interpret their codified rules and standards than their American counterparts, and have more leeway in applying their engineering judgment. In addition, because many program managers belong to the same corps and have followed a similar career path, they tend to invest more trust in the technical decisions of the naval constructors. This shared background also engenders a well-developed sense of *esprit de corps* among the constructors.

And yet, it appears that both the French and British organizations are heading in

the direction of adversarial trust relationships, both externally and internally. Specifically, the global customer and supplier requirement for transparency and accountability (e.g., ISO 9000 standards for quality control) has meant that both the British and French are now beginning to put on paper specific procedures and criteria which had in the past been left to the discretion and good judgment of the designer. The need for clear accountability is also pushing both organizations to more extensive use of third-party audits. In this respect, there is some measure of convergence between the three national design organizations in their mechanisms of trust.

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## CONCLUSIONS

There is no clear consensus as to whether naval ship design organizations have a future. In all countries, but especially in the United States and Great Britain, the need for the government to have any in-house warship design capability has been called into question. The most common argument is that such capability should best be left to industry, as the Air Force and Army do. My view is that the marine industry, unlike, say, the aerospace industry, does not have a robust-enough commercial sector to absorb design talent in the event of downturns. I believe that the only economic way to retain this expertise, with all the required authority to ensure military requirements are met, is to either keep it within government or endow a permanent outside body to act as the government's agent. Either way, the role of the naval ship design organization is still vital. To remain relevant, that organization should have a robust

professional corps of naval constructors with a uniform educational standard and a rotating career path that is outside the civil service and that provides a broad overview of the organization. These at-

tributes will help strengthen the mechanisms of trust within such an organization, to ensure that it operates more smoothly internally and with its customers.

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